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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,540	12/05/2003	Masato Higuchi	36856.1178	8279

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EXAMINER
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MAYES, MELVIN C

ART UNIT	PAPER NUMBER
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1734

DATE MAILED: 06/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/728,540

Applicant(s)

HIGUCHI ET AL.

Examiner

Melvin Curtis Mayes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) 26-32 and 36-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,6,7,9-14,18-21,24,25,33 and 34 is/are rejected.
- 7) ☒ Claim(s) 3-5,8,15-17,22,23 and 35 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/5/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

(1)

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-25 and 33-35, drawn to a method of producing a piezoelectric component, classified in class 156, subclass 250.
- II. Claims 26-32 and 36-38, drawn to a piezoelectric component, classified in class 310, subclass 340.

(2)

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the product as claimed can be made by a different process such as applying a resin coating to an individual piezoelectric element on a substrate.

(3)

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

(4)

During a telephone conversation with Chris Bennet on June 10, 2005 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-25 and 33-35. Affirmation of this election must be made by applicant in replying to this Office action. Claims 26-32 and 36-38 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 112***

(5)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

(6)

Claims 7 and 12-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Claim 7 claims that after the step of pressing, the step of hot-press bonding and the pressing step are carried out using the mold-frame but according to Claim 4, the step of pressing is carried out by a mold-frame and after the step of hot-press bonding. Claim 7 is unclear.

Claim 7 claims that after the step of pressing, the step of hot-press bonding and the pressing step are carried out using the mold-frame but according the Claims 1 and 4, the step of hot-press bonding is carried out by a roller. Claim 7 is unclear.

Claim 12 claims before the mounting step, at least one piece is disposed between elements mounted on the substrate. If the piece(s) is disposed before the mounting step, how can there be elements already mounted on the substrate? Claim 12 is unclear.

Claim 13 recites the limitation "the sheet" in line 3. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

(7)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(8)

Claim 33 is rejected under 35 U.S.C. 102(b) as being anticipated by Furukawa et al. 6,262,513.

Furukawa et al. disclose a method of producing an electronic component comprising: connecting a surface acoustic wave device having an electrode to a printed circuit board having wiring pattern through bumps disposed on the device; disposing a preformed sheet of resin on the device; heating to melt the resin sheet to coat the device and connect to the printed circuit board; and hardening the resin. Furukawa et al. disclose that a plurality of surface acoustic wave devices can be assembled with an aggregate of printed circuit boards, a sheet of resin aligned to the aggregate and melted and hardened, then the aggregate of printed circuit boards is divided (dicing) with the resin sheet to obtain a plurality of individual surface acoustic wave apparatuses (col. 121 and 128, Fig. 14).

(9)

Claims 33 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 2002-217221.

JP '221 discloses a method of making an electronic device comprising: mounting surface acoustic elements 13 having connection electrode 14 (bump) on a mounting substrate 11 having conductor pattern 12; arranging a resin film on the elements; softening the resin film by heating to stick to the mounting substrate in the surrounding parts of the elements using a fixture 30 of the shape of frames which contacts the resin film in the surrounding parts by pressurizing (jig);

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hardening the resin film; and cutting (dicing) the mounting substrate and resin film (computer translation [0044]-[0052]).

***Claim Rejections - 35 USC § 103***

(10)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

(11)

Claims 1, 2, 6, 9-14, 18-21, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa et al. 6,262,513 in view of JP 7-176565.

Furukawa et al. disclose a method of producing an electronic component comprising: connecting a functional device such as a surface acoustic wave device having an electrode to a printed circuit board having wiring pattern through bumps disposed on the device by face-down bonding (flip chip bonding); disposing a preformed sheet of resin such as epoxy on the device; heating to melt the resin sheet to coat the device and connect to the printed circuit board; and hardening the resin. Furukawa et al. disclose that a plurality of surface acoustic wave devices can be assembled with an aggregate of printed circuit boards, a sheet of resin aligned to the aggregate and melted and hardened, then the aggregate of printed circuit boards is divided (dicing) with the resin sheet to obtain a plurality of individual surface acoustic wave apparatuses. Furukawa et al. disclose that the method can be used for functional devices such as surface acoustic wave devices and piezoelectric oscillators or resonators, disclose that a frame-shaped insulating wall or dam can be included to improve the sealing effect and prevent resin from spreading into the space between the device and printed circuit board, disclose that the space (gap) between the device and printed circuit board is in the range of 10-200  $\mu\text{m}$  and disclose that the choice of dimension of the functional device can be suitably done depending on a volume of the device and a thickness of the resin sheet (col. 26, lines 42-47, col. 27, lines 10-15 and 60-63, col. 28, lines 35-37, col. 29, line 57 – col. 31, line 3, col. 121 and 128, Fig. 14). Furukawa et al. do not disclose pressing the resin sheet by a roller during heating to coat the devices and connect to the aggregate of printed circuit boards.



JP 7-176565 teaches that a protective film can be heat laminated to a wiring board substrate using a pair of rollers (computer translation [0023], Fig. 5g).

It would have been obvious to one of ordinary skill in the art to have modified the method of Furukawa et al. for producing an electronic component by heat connecting the resin sheet to the aggregate of printed circuit boards using a pair of rollers, as taught by JP '565, as means used to heat laminate a film to a wiring board. The use of a pair of rollers for heating softening and pressing the resin sheet to the devices on the boards would have been obvious to one of ordinary skill in the art, as suggested by JP '565, as a known method of heat laminating a sheet to a wiring board.

Disposing a resin-flowing out prevent frame on the end portion of the printed circuit board aggregate and sealing-assisting pieces in the form of a sheet of particular height and having openings on the printed circuit board aggregate, as claimed in Claims 9-14, would have been obvious to one of ordinary skill in the art, as Furukawa et al. disclose that a frame-shaped insulating wall or dam can be included to improve the sealing effect and prevent resin from spreading into the space between the device and printed circuit board.

The particular relationship of distance between devices and thickness of devices, as claimed in Claim 19, or relationship between height, volume and number of devices and substrate thickness, as claimed in Claim 20, would have been obvious to one of ordinary skill in the art to achieve a particular desired function of the device.

By the use of a resin sheet of epoxy, a resin film having a volume resistivity of up to about  $10^{10}$   $\Omega$ -m, as claimed in Claim 21, is obviously provided.

***Allowable Subject Matter***

(12)

Claims 3-5, 8, 15-17, 22, 23 and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(13)

Claims 7 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

***Conclusion***

(14)

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The reference disclose applying surface acoustic wave devices and resin to a substrate.

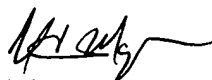
(15)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Melvin Curtis Mayes  
Primary Examiner  
Art Unit 1734

MCM  
June 15, 2005